

SECTION 23 38 13
COMMERCIAL-KITCHEN HOODS

PART 1 - GENERAL

1.1 DESCRIPTION

This section specifies food service, grease-extracting, energy saving, exhaust ventilators.

1.2 DEFINITIONS

- A. Ventilator, kitchen hood, hood and canopy; for purposes of this specification section, these terms all have the same definition.
- B. UL Listed grease extractor: a slotted (not mesh) type grease extractor that has been tested and rated by Underwriters Laboratories.
- C. Eyebrow, compensating, short circuit, short cycle types are not allowed.

1.3 RELATED WORK

- A. Section 05 50 00, METAL FABRICATIONS: Supports for Ventilators.
- B. Section 11 44 00, FOOD COOKING EQUIPMENT: Cooking Equipment.
- C. Section 11 40 21, FOOD SERVICE EQUIPMENT-UTILITY DISTRIBUTION SYSTEM: Utility Distribution Systems.
- D. Section 13 05 41, SEISMIC RESTRAINT REQUIREMENTS FOR NON-STRUCTURAL COMPONENTS: Seismic Restraint of Equipment.
- E. Section 22 11 00, FACILITY WATER DISTRIBUTION: Plumbing Connections.
- F. Section 23 34 00, HVAC FANS: Up-blast kitchen hood exhaust fans.
- G. Section 23 09 23, DIRECT-DIGITAL CONTROL SYSTEM FOR HVAC: Remote monitoring of the kitchen ventilation system.
- H. Section 26 05 21, LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES (600 VOLTS AND BELOW): Electrical Connections.

1.4 QUALITY CONTROL

- A. Installer Qualifications: Experienced in food service equipment installation or supervised by an experienced food service equipment installer.
 - 1. Where required to complete equipment installation, electrician and plumber shall be licensed in jurisdiction where project is located.
- B. NSF Compliance: Equipment bears NSF Certification Mark or UL Classification Mark indicating compliance with applicable NSF standards, including NSF/ANSI 2, NSF 2-Supplement, and NSF/ANSI 4.
- C. UL Listing: Equipment has been evaluated according to UL 710, is listed in UL "Heating, Cooling, Ventilating and Cooking Equipment Directory," and is labeled for intended use.

- D. Fire-Protection Systems: Comply with NFPA 96 and NFPA 17A.
- E. Welding: Perform welding according to AWS D9.1M/D9.1.
- F. Seismic Restraint:
 - 1. Comply with requirements in Section 13 05 41, SEISMIC RESTRAINT REQUIREMENTS FOR NON-STRUCTURAL COMPONENTS.
 - 2. Comply with applicable guidelines for seismic restraint of kitchen equipment contained in SMACNA's "Kitchen Ventilation Systems and Food Service Equipment Guidelines," Appendix A.
- G. In-Use Service: At least one factory-authorized service agency for equipment shall be located in the geographical area of the installation and shall have the ability to provide service within 24 hours after receiving a service call.

1.5 SUBMITTALS

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Manufacturer's Literature and Data:
 - 1. Include manufacturer's address and telephone number.
 - 2. Include catalog or model numbers, and illustrations and descriptions of ventilators and accessories.
- C. Installation Drawings: Show dimensions; method of assembly; and details of installation, adjoining construction, coordination with service utilities, and other work required for a complete installation.
- D. Field Test Reports: Indicate dates and times of tests and certify test results.
- E. Operating Instructions: Include operating instructions covering operation of all components and maintenance procedures covering proper cleaning and necessary lubrication or adjustments to controls.

1.6 WARRANTY

- A. Warrant food service equipment to be free from defects in materials and workmanship in accordance with requirements of "Warranty of Construction" article in FAR clause 52.246-21.

1.7 APPLICABLE PUBLICATIONS

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.
- B. American Welding Society (AWS):
 - D9.1M/D9.1-2006.....Sheet Metal Welding Code
- C. ASTM International (ASTM):

- A666-03.....Standard Specification for Annealed or Cold-
Worked Austenitic Stainless Steel Sheet, Strip,
Plate, and Flat Bar
- D. National Association of Architectural Metal Manufacturers (NAAMM):
AMP500-06.....Metal Finishes Manual for Architectural and
Metal Products, 2006
- E. NFPA International (NFPA):
#96-2008.....Standard for Ventilation Control and Fire
Protection of Commercial Cooking Operations
- F. NSF International/American National Standards Institute (NSF/ANSI):
Standard #2-2009.....Food Service Equipment
Standard #4-2009.....Commercial Cooking, Rethermalization, and
Powered Hot Food Holding and Transport
Equipment
- G. Sheet Metal and Air Conditioning Contractors' National Association
(SMACNA):
1767-2001.....Kitchen Ventilation Systems and Food Service
Equipment Fabrication and Installation
Guidelines
- H. Underwriters Laboratories Inc. (UL):
#710-06.....Exhaust Hoods for Commercial Cooking Equipment

PART 2 - PRODUCTS

2.1 EXHAUST HOODS

- A. The hood shall be constructed of a minimum of 18 gauge, (type 304) stainless steel with a #3 finish. Hood shall be constructed using the standing seam method for optimum strength. The seams on the canopy shall be welded liquidtight, and all exposed external welds shall be ground and polished to match the original finish of the metal. Lighter material gauges, alternate material types and finishes (400 series stainless steel, cold rolled steel, etc.) and non-liquidtight welding (tack weld, spot weld, etc.) is not acceptable. Construction shall include corrosion-resistant steel framing members for strength. Short circuit style hoods are not allowed. Hood shall be of a design to lower the CFM requirements by at least 20 to 30 percent. This can be accomplished by various internal configurations or air deflectors.
- B. Designer to verify CFM and pressure drop with manufacturer.

INTERNATIONAL MECHANICAL REQUIREMENTS PER LINEAR FOOT	
TYPE OF HOOD	CFM
EXTRA HEAVY-DUTY COOKING APPLIANCES	
Double Island Canopy (per side)	550
Single Island Canopy	700
Wall-Mounted Canopy	550
HEAVY-DUTY COOKING APPLIANCES	
Double Island Canopy (per side)	400
Single Island Canopy	600
Wall-Mounted Canopy	400
MEDIUM-DUTY COOKING APPLIANCES	
Double Island Canopy (per side)	300
Single Island Canopy	500
Wall-Mounted Canopy	300
LIGHT-DUTY COOKING APPLIANCES	
Double Island Canopy (per side)	250
Single Island Canopy	400
Wall-Mounted Canopy	200

- C. Hood shall include UL listed and NSF certified grease extractor type, high efficiency cartridge style baffle filters of adequate number and sizes to ensure optimum performance in accordance with manufacturer's published information. The filter housing shall terminate in a pitched, full length grease trough, which shall drain into a removable grease container. Hood shall be provided with one (1) filter removal tool.
- D. Vapor proof, UL Listed, recessed Incandescent light fixtures shall be prewired to a junction box situated at the top of the hood for field connection. Wiring shall conform to the requirements of the National Electrical Code (NEC #70).
- E. Demand ventilator control system shall be installed in the hood. The demand system shall sense the heat/smoke/vapor and shall vary the speed of the exhaust fan according to the need. The demand system shall utilize various types of sensors to accomplish this, such as exhaust temperature sensor, optic sensor, carbon dioxide sensor and other state of the art sensing devices.
- F. Fire protection systems: Wet chemical with wall-mounted stainless-steel cabinet.
1. Fire-protection system to provide duct, plenum, and surface protection for ventilator and equipment located below ventilator.
 2. System interwired with shunt trip breaker and gas solenoid valve of equipment located below ventilator for power and fuel shutoff during system actuation.

G. Options

1. Enclosure Panels: 1.3 mm (0.05 inch) thick stainless steel shall be installed; locate between ventilator top and ceiling on all exposed sides.
2. ALL EXPOSED AREAS OF HOOD TO BE FINISHED.
3. Remote monitoring of the demand ventilation control showing what is transpiring during the course of a day. Provide remote monitoring of the kitchen ventilation system via the DDC control system.
Coordinate interface with Section 23 09 23, DIRECT-DIGITAL CONTROL SYSTEM FOR HVAC.
5. Fresh air make-up plenum incorporated into the front face of the hood or provided at ceiling line immediately in front of the hood.

H. Exhaust Ventilator System Requirements:

SYMBOL	Description	Type
1-HD1	Ventilator	Dual sided
1-HD2	Ventilator	Dual sided
1-HD1	Fire-protection system with remote, wall-mounted pull station(s) located near door(s)	-
1-HD2	Fire-protection system with remote, wall-mounted pull station(s) located near door(s)	-

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install ventilators level and plumb with access clearances required for operation, maintenance and cleaning and in accordance with the manufacturer's published documentation.
- B. Coordinate installation of ventilators with overhead supports; see Section 05 50 00, METAL FABRICATIONS.
- C. Interconnect ventilators to service utilities.
- D. Install seismic restraints for equipment.

3.2 FIELD TESTING

- A. Field Testing, General: Following installation, test ventilators for compliance with specified requirements and those of authorities having jurisdiction. Perform testing after air-handling systems have been balanced and adjusted.
- B. Smoke Test:
 1. Test Conditions:

- a. Perform tests with cooking equipment served by ventilator turned off.
 - b. Perform tests with supply and exhaust fans serving the food service kitchen area turned on.
- 2. Test Procedure: Move a smoke bomb around the perimeter of cooking equipment at the top surface.
- 3. Test-Performance Requirements: No visible smoke shall escape from the ventilator canopy into the room.
- C. Demand Ventilator Control Test:
 - 1. Test Conditions:
 - a. Perform tests with cooking equipment served by exhaust ventilator turned off.
 - b. Perform tests with air-handling units serving food service kitchen turned on.
 - 2. Test Procedure: Turn on equipment and measure speed of exhaust fan(s) as equipment heats up. Move a smoke bomb around the perimeter of the cooking equipment at the top surface and continue to measure speed of exhaust fan(s).
 - 3. Test-Performance Requirements: Speed of fan(s) should increase/decrease with the severity of the heat or smoke.
- D. Wet Fire Extinguishing System: Test system to verify that equipment operation complies with NFPA 96 and NFPA 17A.

3.3 CLEAN-UP

- A. At completion of the installation, clean and adjust equipment as required to produce ready-for-use condition.
- B. Where stainless-steel surfaces are damaged during installation procedures, repair finishes to match adjoining undamaged surfaces.

3.4 INSTRUCTIONS

Instruct personnel and transmit operating instructions in accordance with requirements.

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